Essential Ingredients for Mac OS X Imaging Solutions

Session 210

These are confidential sessions—please refrain from filming or taking pictures.

Graphics and Media

Essential Ingredients for Mac OS X Imaging Solutions

Werner Neubrand
Job Title

http://developer.apple.com/wwdc2005/

Sample Code: myPhoto

Lightweight digital camera utility application

- Image Capture
  - Device discovery
  - Registering for notifications
  - Getting device/image properties
  - Displaying thumbnails
  - Controlling a digital camera
  - Downloading images
  - Working with wireless devices
- ImageIO
  - Working with image file formats

Device Discovery

How do you find out if/what Image Capture device is connected?

ICAGetDeviceList

ICACopyObjectPropertyDictionary

Device Discovery

- Image Capture APIs
  - Have two parameters
    - Parameter block
    - Callback function
  - Can be called synchronously or asynchronously

Device Discovery

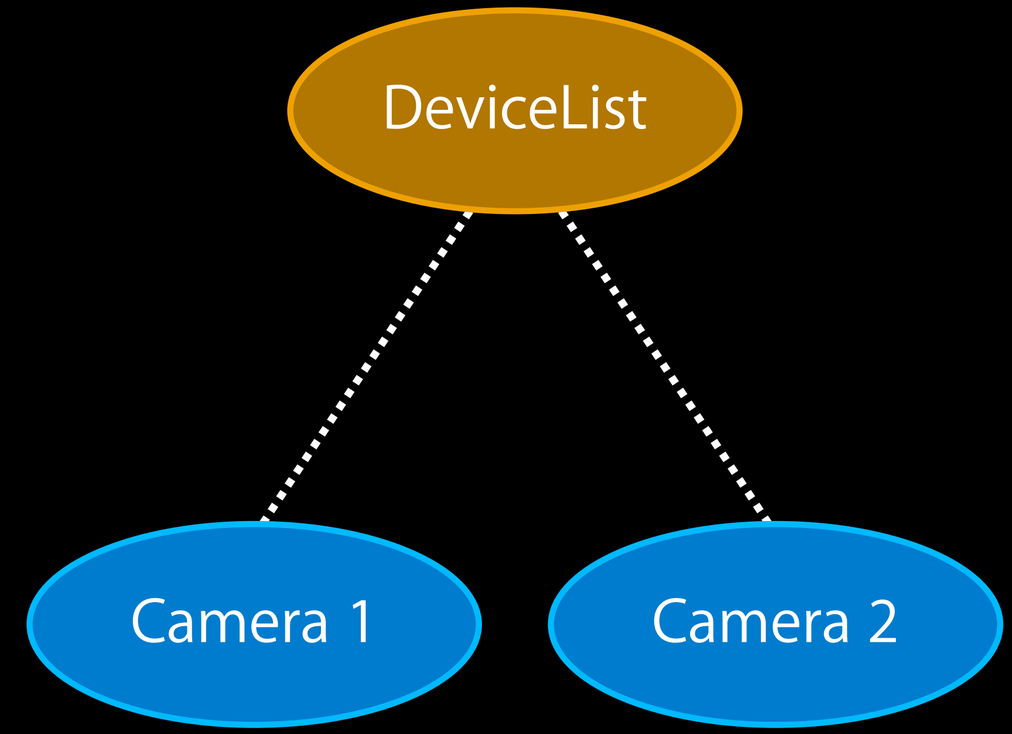
ICAGetDeviceList

- Returns the root-level ICAObject
- You'll always get the DeviceList ICAObject—even without Image Capture devices connected

Device Discovery

ICACopyObjectPropertyDictionary

- Returns information about an ICAObject
- For the DeviceList the dictionary contains information about each connected device
  - Name
  - Type
  - Device module
  - Connection info



Supported Device Types

- MassStorage (iPod, …)
- PTP (Picture Transfer Protocol)
- …

Demo: Step 1

Registering for Device Notifications

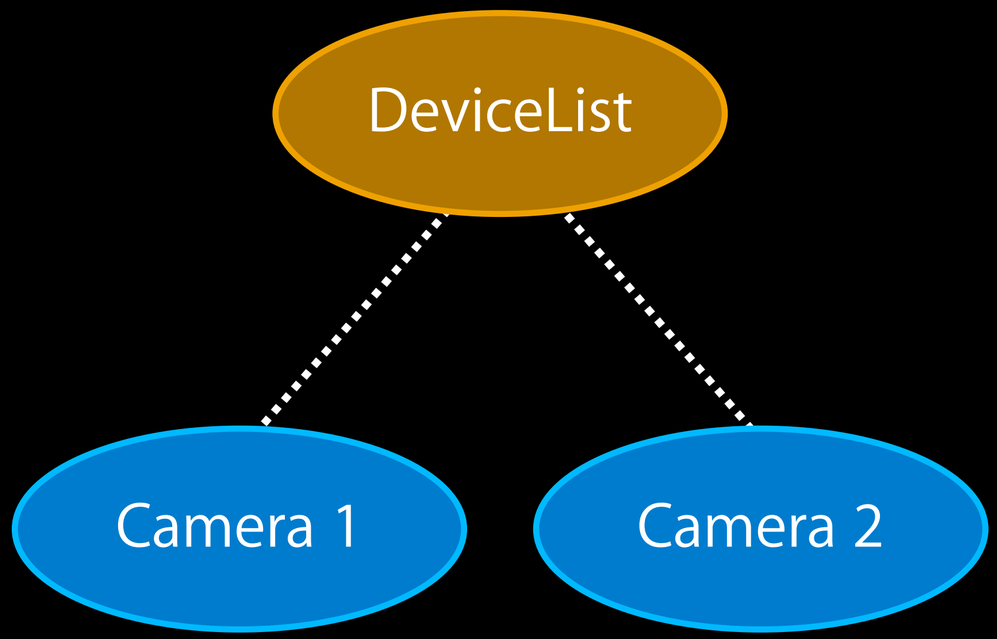
How do you make sure that you'll get notified when an Image Capture device is connected/disconnected?

ICARegisterEventNotification

Registering for Device Notifications

ICARegisterEventNotification

- Allows you to register for a specific event (device removed), or
- Allows you to register for all events



Registering for Device Notifications

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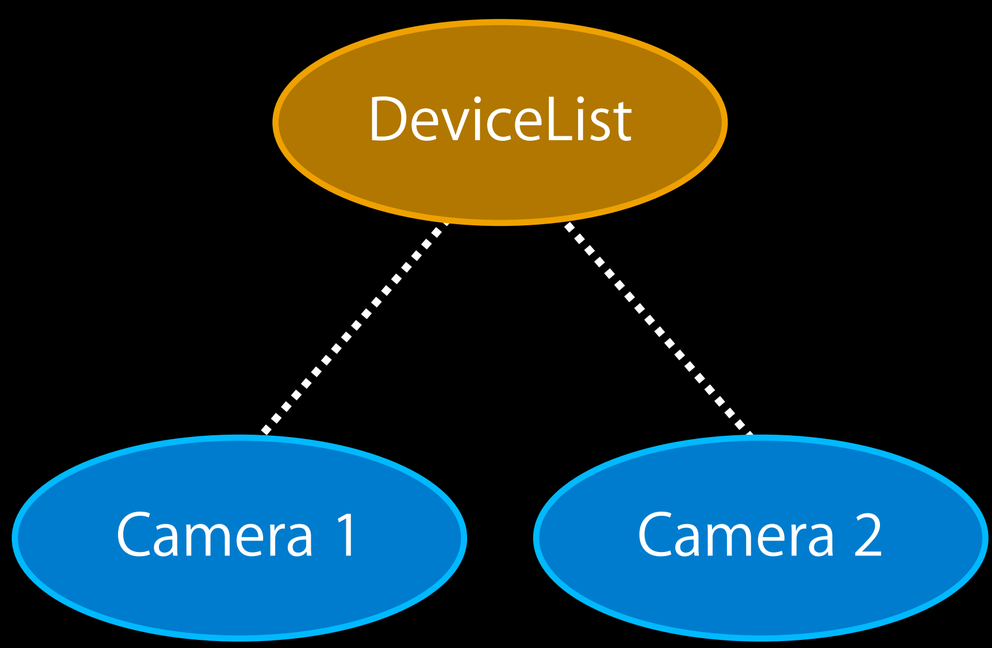

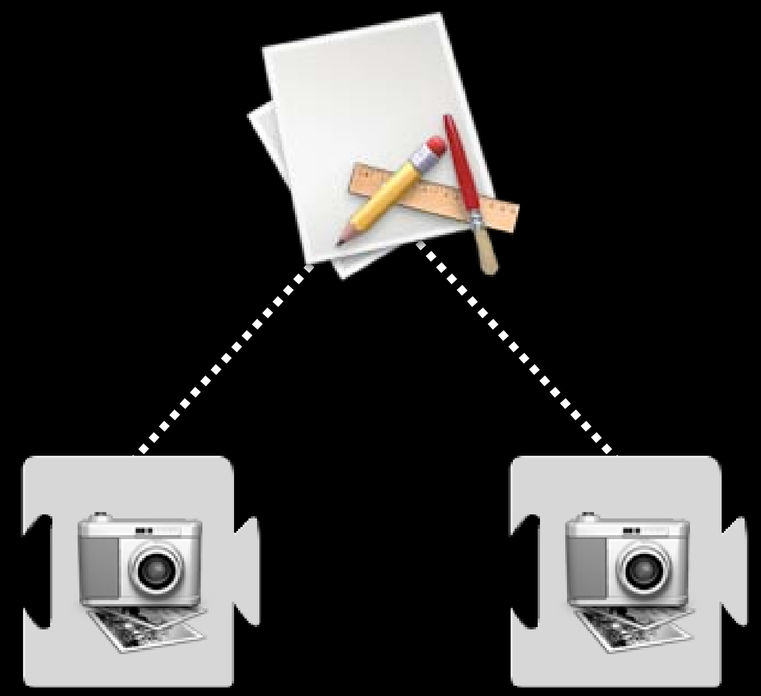

Registering for Device Notifications

ICARegisterEventNotification

- Allows you to register for a specific event (device removed), or
- Allows you to register for all events

Step 2

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Getting Device Properties

How do you get the list of images that are stored on a digital camera?

ICACopyObjectPropertyDictionary

Getting Device Properties

ICACopyObjectPropertyDictionary

- Returns information about an ICAObject
- For a device ICAObject the dictionary contains information about the device and it’s images
  - Name
  - Type
  - Device module
  - Connection info
  - Device capabilities
  - ‘Data’-array
  - ‘Tree’-dictionary

Getting Device Properties

ICACopyObjectPropertyDictionary

- ‘Data’-array
  - Flattened out array of images/movies/music
  - Contains one dictionary per item
    - Name
    - Size
    - ICAObject
    - Flags (locked/raw/…)

Getting Device Properties

ICACopyObjectPropertyDictionary

- ‘Tree’-dictionary
  - “Same” information as ‘data’-array
  - Hierarchical information
    - Images/movies/music
    - Other files

Getting Device Properties [2]

How do you get the device icon?

ICACopyObjectThumbnail

Getting Device Properties [2]

ICACopyObjectThumbnail

- Returns the device icon in different flavors
  - JPEG
  - TIFF
  - ICAThumbnail
- TIFF flavor has alpha channel

Step 3

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Step 4

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Getting Image Properties

How do you get more information about an image stored on a camera?

ICACopyObjectPropertyDictionary

Getting Image Properties

ICACopyObjectPropertyDictionary

- Returns information about an ICAObject
- For an image ICAObject the dictionary contains
  - Name
  - Date
  - Size
  - EXIF information
    - ColorSpace, EXIF-orientation, flash, …

Displaying Thumbnails

You got the name and meta-data for an image—how do you get the image thumbnail?

ICACopyObjectThumbnail

Getting Image Properties

ICACopyObjectThumbnail

- Returns the image icon in different flavors
  - JPEG
  - TIFF
  - ICAThumbnail

Step 5

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Downloading Images

How do you download images from the camera to your hard disk?

ICADownloadFile

Downloading Images

ICADownloadFile

- Allows you to download a given ICAObject
- You specify
  - Download folder
  - Flags
  - Create custom icon
  - Rotate
  - Delete after download
  - Adjust file creation date
  - …

Downloading Images

ICADownloadFile

- Will work with local and remote devices
- Will embed ColorSync profile—either
  - The default profile that's registered for the device
  - User overwrite
  - EXIF 2.2

Step 6

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Controlling a Digital Camera

How do you tell the camera to take a picture?

ICAObjectSendMessage

Controlling a Digital Camera

ICAObjectSendMessage

- If the device supports ‘take picture’
  - Send ‘kICAMessageCameraCaptureNewImage’
  - Call returns ‘immediately’
  - You’ll get notified when image was taken/saved

Working With Wireless Devices

Push and pull—how can you handle both modes?

ICARegisterEventNotification

Step 7

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Working With RAW Images

What about RAW images?
How are they handled differently from JPEGs/TIFFs?

Supported by ImageIO.framework

Working With RAW Images

- Mac OS X ‘Tiger’ has new ImageIO.framework
  - Used in Image Capture/Preview/Safari/…
  - Handles a lot of different file formats
    - Supports ‘standard’ formats TIFF, JPEG, PNG, …
    - Supports camera RAW file formats (Canon, Nikon, Minolta, Olympus, …)
  - Supports Metadata
    - EXIF, IPTC, CIFF, GPS, MakerNotes, …
  - Same set of APIs for all formats

ImageIO

- Reading
  - CGImageSource
    - CGImageSourceCreateImageAtIndex
    - CGImageSourceCreateThumbnailAtIndex
    - CGImageSourceCopyProperties
- Writing
  - CGImageDestination
    - CGImageDestinationAddImage

Step 8

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More Samples

- TimeLapse
- CopyMachine
- Image Capture and Automator

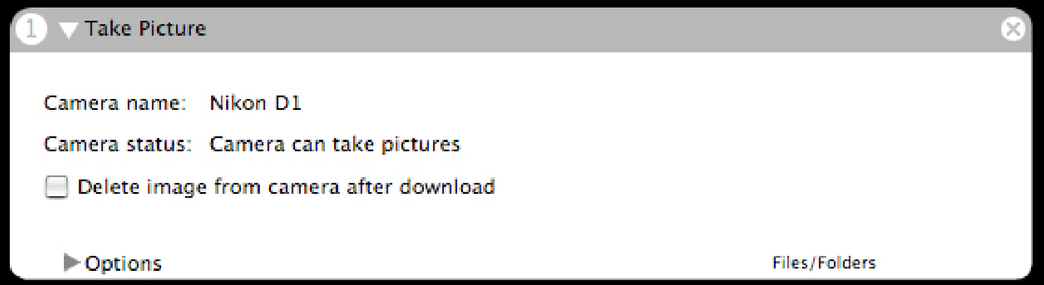
TimeLapse

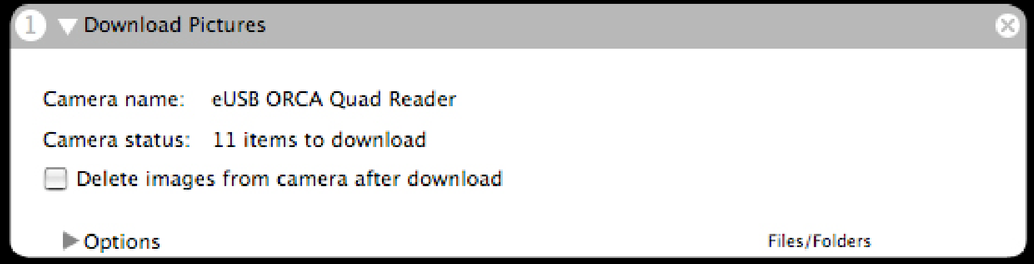
- Focus on
  - Device discovery
  - Device notifications
  - Taking a picture
  - Downloading an image
  - Creating a QuickTime movie

CopyMachine

- Focus on
  - Device discovery
  - Device notifications
  - Getting scanner properties
  - Scanning
  - Printing

Image Capture and Automator





More Information

http://developer.apple.com/wwdc2005/

Documentation, Sample Code, and Other Resources

http://developer.apple.com/wwdc2005/

Related Sessions

Mac OS X Color Image Management Explained	Session 209 Wednesday 2:00PM
Core Image, Image Units, Image I/O, ColorSync, and Image Capture Lab	Lab Thursday 12:00PM
Graphics and Media Feedback Forum	Session 217 Friday 2:00PM

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